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INFORMATION: Policy Regarding Impact of Modifications and Repairs on the Damage Tolerance Characteristics of Transport Category Airplanes

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All transport category airplanes having the damage tolerance requirements of § 25.571 (Amendment 25-45), as their certification bases and those with mandated Supplemental Inspection Documents (SID'S), which were assessed to the damage tolerance requirements of § 25.571 (Amendment 25-45), must continue to maintain their damage tolerance characteristics when repaired or modified in any way. This includes all airplanes of a model even though all the individual airplanes are not candidate airplanes or part of the sample set defined in the respective SID. Any modification which affects the loading spectrum, the stress levels, or the damage tolerance characteristics of the structure must be re-assessed to determine its impact on the inspection program. In addition, this may require the development of additional inspection requirements for the modification.

Most of the current inspection programs are based on statistical sampling of Principal Structural Elements (PSE's) in accordance with the manufacturer's SID. The statistical sampling is justified based on the assumption that the sample population is representative of the fleet and that the inspection methods will ensure continued airworthiness of the entire fleet. The SID programs are based on type design crack growth data generated from analysis or structural tests using a realistic and conservative loading spectrum, material properties, part geometry, etc. For this reason structural modification that may increase stress levels in load carrying structures, including maximum weight limit increases, cargo door installations, and repairs to load carrying structures, must be re-assessed for its impact on the structural inspection program. Also, modifications affecting the detail design, including geometry and material properties, must be reassessed to the damage tolerance criteria and adjustments made in the inspection program to ensure continued airworthiness.

In general, modified structure will not be represented by structure in the SID fleet, therefore special inspections may be needed to ensure continued airworthiness of the modified airplane. Where special inspections are required to ensure continued airworthiness, these special inspection programs become a part of the type design for the modified structure and must be incorporated into the maintenance programs. These inspections or procedures should be documented in accordance with the provision of the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by § 25.1529.

Where structures are modified under the approval of a supplemental type certificate (STC), any special inspection procedures must be included in the STC and made a part of the inspection program for that airplane. These inspections or procedures should also be documented in accordance with the provisions of § 25.1529.

Special inspections on structures modified under the approval of an amended type certificate will be handled in accordance with procedures established for handling alternate type designs.

To provide widespread awareness of the application of the provision of this memo, the responsible TC issuing certification office should add the following note to the TC Data Sheet on all airplanes that have mandated SSIP programs.

This model airplane has a mandated supplemental Structural Inspection Program (SSIP). This program was prepared in accordance with the provisions of AC 91-56. Evaluation of structural elements, type of damage considered (fatigue, corrosion, service, and production damage) and the inspection and /or modification criteria should, to the extent practicable, be in accordance with the damage tolerance principles (Amendment 25-45) of the current FAR 25.571 standards.

Signed by
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